NEW RECORDS AND SPECIES OF AUSTROMALAYAN LAELAPID MITES.

By Robert Domrow, Queensland Institute of Medical Research, Brisbane.

(Sixty Text-figures.)

[Read 28th August, 1963.]

Synopsis.

Data considerably extending the known distributional and host-ranges of some Austromalayan laelapid mites are recorded. Of the 20 genera listed, all are known except one, *Hattena* (type species by monotypy, *H. erosa*). Of the 45 species listed, six are new, as follows: *Haemolaelaps hattenae,* n. sp., from a rat-kangaroo, *Bettongia cuniculus,* Tasmania; *Hattena erosa,* n. g., n. sp., from a bird, British North Borneo; *Ichoronyssus radovskyi,* n. sp., from a bat, Malaya; *Laelaps cybiala,* n. sp., from the broad-toothed rat, *Mastacomys fuscus,* New South Wales, Victoria and Tasmania; *Liponyssoides warnckei,* n. sp., from a swiftlet, *Collocalia banicorensis,* and a bat, *Miniopterus schreibersi,* New Guinea; and *Ornithonyssus latro,* n. sp., from a bat, *Eptesicus pumilus,* New South Wales. The subfamily Myonyssinae (represented by *Myonyssus decumani*), and the ear-mite of cattle (*Raillietia auris*), are recorded from the Southern Hemisphere for the first time.

Mite material received recently from many sources in Australia has yielded a fine collection of laelapid mites. These comprise several new species, and numerous valuable records of known species. These are figured, described and recorded below. The opportunity has also been taken to include some Malaysian material received from the Smithsonian Institute, U.S. National Museum (Domrow, 1962), and some drawings prepared while I was on half-time loan to the Institute for Medical Research, Kuala Lumpur, to participate in a project *Bionomics of Oriental-Australasian acarine vectors* sponsored by the G. W. Hooper Foundation (University of California Medical Center), and supported by U.S. Public Health Service Research Grant AI–03793–03 (formerly E–3793), National Institute of Allergy and Infectious Diseases. It is too space-consuming to mention the many donors by name here, but all collectors are carefully acknowledged in the systematic list below. I am most grateful to them all, for, in this area, material from even well-known animals is always welcome. Many new species are undoubtedly still to be found on the numerous animals not yet examined for mites.

The type series of the new species are distributed among the following institutions, abbreviated

BMNH, British Museum (Natural History), London;
IMR, Institute for Medical Research, Kuala Lumpur;
NIC, National Insect Collection, C.S.I.R.O., Canberra;
QIMR, Queensland Institute of Medical Research, Brisbane;
SPHTM, School of Public Health and Tropical Medicine, Sydney;
USNM, United States National Museum, Washington.

Dermanyssus gallinae (de Geer).

Acarus gallinae de Geer, 1778, *Mem. Hist. Insect.*, 7: 106.—*Dermanyssus gallinae*, Hirst, 1922, *Mites injurious to domestic animals*, B.M.(N.H.), London, p. 87.

This species, and the three known species of *Ornithonyssus* included herein, are listed because, although all four have been recorded from Australia, I have seen so much misidentified material among old "economic" collections that a formal recognition of their presence in Australia seems desirable. Very numerous females and nymphs from the coops of domestic fowl, Warracknabeal, Victoria, xi.1962, V. M. Rodda. I am unable to separate one female from *Meliphaga flavicollis*, Cascades, Hobart, Tasmania,

15.i.1961, B. C. Mollison, except by its dorsal shield's possessing only eleven pairs of setae rather than the fifteen typical of the species. According to Evans and Till's key just received (1962, *Ann. Mag. nat. Hist.*, (13) 5: 273–293), this specimen would be *D. hirundinis* (Hermann, 1804).

Echinonyssus nasutus Hirst. (Figs 1–2.)

Echinonyssus nasutus Hirst, 1925, *Proc. zool. Soc. Lond.*, p. 51.

As only the ventral surface was figured in the original description, a figure of the dorsum is given here. I have seen the following material from *Tupaia glis*—one female, Subang, Selangor, Malaya, 28.xii.1956, R. Traub; seven females, secondary rainforest, SW of Tapuh, Sarawak, 6.vii.1958, T. C. Maa.

With the description (Bregetova and Grokhovskaja, 1961) of such intermediate forms of *Hirstionyssus* da Fonseca, 1948, as *H. indosinensis* and *H. callosciuri*, it is clear that these two genera are synonyms.

Text-figs 1-2. *Echinonyssus nasutus* Hirst. Female.—1, Venter; 2, Dorsum. (The divisions on all scales represent 100μ, unless otherwise indicated.)

Echinonyssus validipes Domrow.

Echinonyssus validipes Domrow, 1955, Proc. Linn. Soc. N.S.W., 80: 133.

Three males from *Potorous tridactylus* (Kerr), Tooloom, New South Wales, 15.xi.1961, J. H. Calaby; two females and one male from *P. tridactylus*, Sandfly, Tas., 8.v.1962, B.C.M. This is the type host.

Eulaelaps phalacrus Domrow.

Eulaelaps phalacrus Domrow, 1960, *Acarologia*, 2: 438.

The following specimens from *Rhinosciurus laticaudatus* in Malaya will confirm the original host record—58 females, Ulu Gombak Forest Reserve 800′, 16 miles N Kuala Lumpur, Selangor, 22.viii.1956, R.T. and Phang Ong Wah; 97 females, Ulu Gombak F.R., 17 m. N KL, 16.xii.1957, R.T.; two females, Kepong Forest Reserve, Selangor, 11.iii.1958, R.T. and P.O.W.; 70 females, Klang Gates, Selangor, 5.ii.1959, P.O.W. and B. Ensoll; 5 females, Bukit Pelindong, Kuantan, Pahang, 22.vi.1957, Div. Med. Zool., I.M.R.; 13 females, Bt. Pelindong, 24.vi.1957, same coll.; five females, Kledang Saiong Forest Reserve, 10 miles W Ipoh, Perak, 20.ix.1958, R.T. (According to the Survey Dept., this forest reserve is in the Kuala Kangsar area. They also note a Gunong Kledang 10 miles W Ipoh, and a G. Saiong 20 miles N Ipoh.)

EULAELAPS STABULARIS (Koch).

Gamasus stabularis Koch, 1836, *Deutschl. Crustac. Myriap. Arachn.*, 4: 13.—*Eulaelaps stabularis*, Domrow, 1960, *Acarologia*, 2: 436.

Two further females of this species have come to hand from Malaysia—*Tupaia glis*, forest, Maxwell's Hill 4400′, Perak, Malaya, 21.vi.1958, R.T.; ? civet (native name *sinbong**), Tenompak, Mt. Kinabalu, British North Borneo, 9.ii.1959, T.C.M.

GYMNOLAELAPS ANNECTANS Womersley.

Gymnolaelaps annectans Womersley, 1955, *Aust. J. Zool.*, 3: 419.—*G. annectans*, Domrow, 1961, PROC. LINN. SOC. N.S.W., 86: 61; 1962, *Aust. J. Zool.*, 10: 274.

This species has been associated with numerous animals, both birds and mammals. Further records comprise four females from the nests of fairy penguins, Bowen Is., N.S.W., i.1962, B. McMillan; one female from *Isoodon obesulus*, St. Valentine's Peak, Tas., 13.viii.1962, B.C.M.

HAEMOLAELAPS DOMROWI Womersley.

Haemolaelaps domrowi Womersley, 1958, PROC. LINN. SOC. N.S.W., 82: 301.

This species is common on bandicoots in eastern Australia. I give here only an additional record from Tasmania, one female from *Perameles gunnii*, Maydena, 29.xi.1960, B.C.M.

HAEMOLAELAPS GALLINARII Grokhovskaja and Nguyen Xuan Hoe.

Haemolaelaps gallinarii Grokhovskaja and Nguyen Xuan Hoe, 1961, *Zool. Zh.*, 40: 1634.—*Haemolaelaps audyi* Baker, Traub and Evans, 1962, *Pacific Insects*, 4: 92.

A new host record for this species, which is common on squirrels in S.E. Asia, is one female, *Callosciurus j. jentinki*, cloud forest 6300′, Lumu Lumu, Mt. Kinabalu, B.N.B., 21.vii.1950, R.T.

HAEMOLAELAPS HATTENAE, n. sp. (Figs 3–5.)

Diagnosis.—A member of the *H. marsupialis* complex, but immediately separable from the other four species by the presence of two pairs of usurped ventral setae on the genitoventral shield.

Type material.—Holotype female and five paratype females from the Tasmanian rat-kangaroo, *Bettongia cuniculus* (Ogilby) (Macropodidae), Green's Beach, Tas., 4.iv.1962, R. H. Green. Holotype NIC; paratypes BMNH, USNM, QIMR.

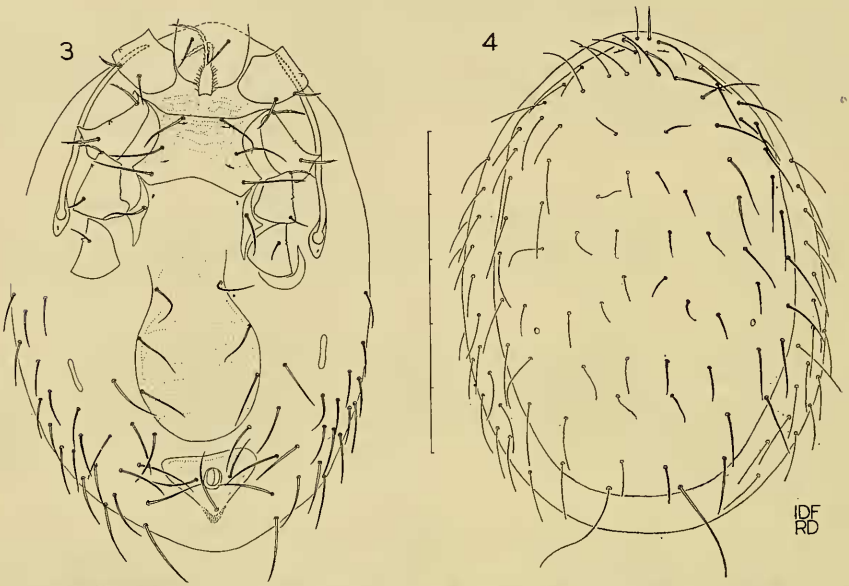
Female.—Idiosoma oval, from 803 to 847μ long. Dorsal shield with 39 pairs of setae, the posterior pair being twice as long as the marginal, and four times as long as the discal setae. Pores are present on the shield, but their disposition is not clear in the material at hand. Dorsal marginal cuticle with about seventeen to nineteen pairs of setae similar to those on dorsal shield.

Venter. Sternal shield with anterior margin straight, and posterior margin concave; preceded anteriorly by evenly arranged striae; anterior two-thirds of shield also striate. Usual six sternal setae and four lyriform pores present on shield. Metasternal complex fully formed. Genitoventral shield expanded behind coxae IV, with two pairs of usurped ventral setae behind genital pair. These three pairs of setae are all distinctly on the plate in all six specimens of the type series. Fourth pair of ventral setae usurped in *Laelaps* distinctly off the shield. Ventral cuticle with an additional 20–22 pairs of setae. Anal shield triangular, separated from genitoventral shield by a strip of cuticle narrower than length of anus. Adanal setae at level of centre of anus, rather weaker than postanal seta. Metapodal shields well formed, elongate. Peritremes extending forward to anterior margin of coxae I; peritremal shields not fused to sclerotized band behind coxae IV.

Legs. Coxal setal formula 2.2.2.1, some of the setae being weakly barbed like the other stronger body setae, but otherwise not modified in any way.

* Harrison and Traub (1953) collected the Dusun word *sim bôn* at Tenompak for the ferret badger, *Melogale orientalis*.

Gnathosoma. Tritosternal base strongly barbed laterally; laciniae ciliated. Deutosternal groove with about six rows of denticles, each with two to five teeth. Inner posterior hypostomal setae the longest, and outer pair the shortest of the four pairs of setae on gnathobase. Palpi undistinguished, with bifurcate claw, and two clavate setae on inner face of genu. Labial cornicles well defined. Epipharynx elongate, acutely pointed. Fixed digit of chelicerae hyaline, edentate; pilus dentilis elongate, but not as long as in *H. marsupialis*. Movable digit sclerotized, with strongly curved point, and two teeth.



Text-figs 3-4. *Haemolaelaps hattenae*, n. sp. Female.—3, Venter; 4, Dorsum.

Haemolaelaps marsupialis Berlese.

Laelaps (*Haemolaelaps*) *marsupialis* Berlese, 1910, *Redia*, 6: 261.—*Haemolaelaps marsupialis*, Keegan, 1956, *Trans. Amer. micr. Soc.*, 75: 315–6.

Although this species is rare on bandicoots in north Queensland, it is common south of Brisbane. The following Tasmanian records will confirm its southern range—*Isoodon obesulus*, Green's Beach, 28.i.1961, B.C.M.; Perth, 8.viii.1961, R.H.G.; Eaglehawk Neck, 9.ix.1961, T. Andersen; Cascades, Hobart, 5.vii.1962, B.C.M.; St. Valentine's Peak, 13.vii.1962, B.C.M.; St. Valentine's Peak, 2.ix.1962, T.A.; Rokeby, 19.ix.1962, T.A.; *Perameles gunnii*, Maydena, 29.xi.1960, B.C.M.; Kingston, 24.ix.1962, T.A.

Haemolaelaps quartus Domrow.

Haemolaelaps quartus Domrow, 1961, Proc. Linn. Soc. N.S.W., 86: 61.

The following records from *Aepyprymnus rufescens* will confirm the original host record—one female, Camp Mt., S.E. Queensland, 17.vii.1954, E. N. Marks; two females, Tooloom, N.S.W., 14.xi.1961, J.H.C.

Haemolaelaps traubi (Strandtmann).

Atricholaelaps traubi Strandtmann, 1948, *Proc. ent. Soc. Wash.*, 50: 187.—*Haemolaelaps traubi*, Baker, Traub and Evans, 1962, *Pacific Insects*, 4: 91.

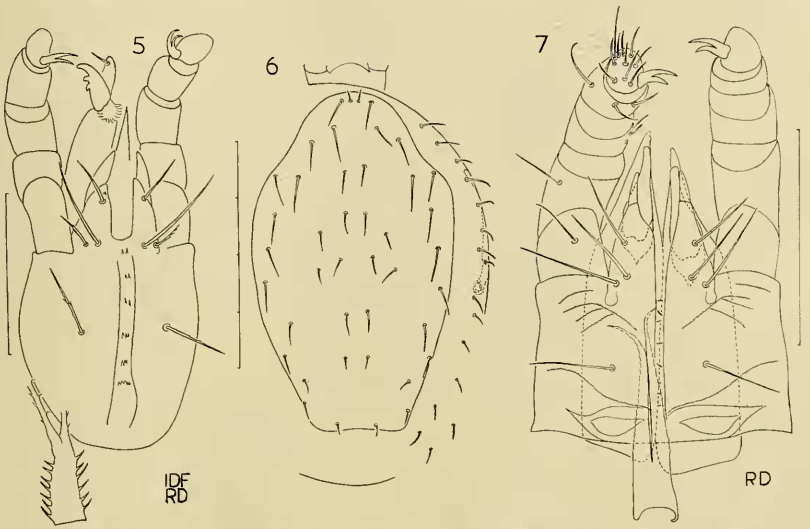
A new host record for this species, which is common on squirrels in S.E. Asia, is one female, *Rhinosciurus laticaudatus*, Pahang Road 16 miles N Kuala Lumpur, 5.vii.1948, R.T.

Hattena, n. g.

Diagnosis.—At couplet 45 (a rather subjective one involving the strength of the labial cornicles and chelicerae), in the key of Baker, Camin *et al.* (1958), it is difficult

to decide if this new genus is laelapid or dermanyssid. Strandtmann and Camin (1956) also have difficulty in separating these two groups at family level, and several workers, including myself, now prefer to treat them, and several other groups, as subfamilies at most of the Laelapidae *sensu* Vitzthum. The new genus has the following "dermanyssid" characters (mostly involving the gnathosoma)—labial cornicles rather weak; cheliceral digits weakly dentate; corona absent; pilus dentilis probably absent; peritremalia encircling coxae IV. In the keys of Strandtmann and Wharton (1958) and Zumpt and Till (1961), the new genus runs out near *Macronyssus*, *Sauronyssus* and *Ichoronyssus*. *Hattena* may be immediately separated from these three genera by its abbreviated genital shield and the extreme erosion of the sternal shield, which takes in only the first pair of sternal setae and pores.

Type species by monotypy—*Hattena erosa*, n. sp.



Text-fig. 5. *Haemolaelaps hattenae*, n. sp. Female. Gnathosoma.
Text-figs 6-7. *Hattena erosa*, n. g., n. sp. Female.—6, Dorsum; 7, Gnathosoma.

HATTENA EROSA, n. sp. (Figs 6–8.)

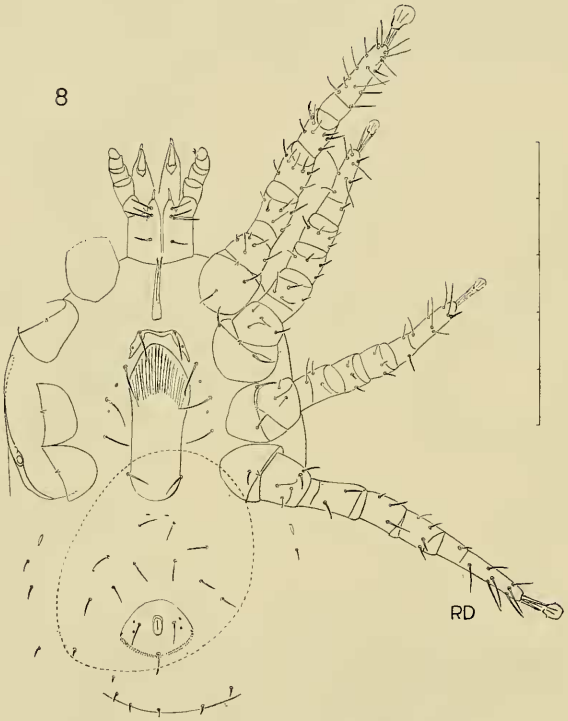
Type material.—Holotype female and six paratype females from a bird RTB9070, Kamborangah, Mt. Kinabalu 7800′, B.N.B., 26.vii.1951, R.T. Holotype USNM; paratypes USNM, BMNH, QIMR, R. Traub.

Female.—Idiosoma 715–825μ long in somewhat flattened condition. Dorsal shield truncate posteriorly, with 21 pairs of setae. Marginal cuticular setae about sixteen on each side.

Venter. Sternal shield much reduced to an irregular crescent bearing two setae and two pores. All remaining sternal and metasternal setae and pores set free in cuticle. Genital shield small, not expanded or extending beyond level of posterior borders of coxae IV; with genital setae set on extreme margin near posterior of shield. Anal shield strongly convex in anterior half, and with cribrum occupying all of posterior margin. Anus set in anterior half, and flanked by two adanal setae. Postanal seta near posterior angle, about as long as adanals. Ventral cuticle with about ten to twelve pairs of setae, and two extremely minute platelets immediately behind the genital plate. Metapodal shields elongate, minute. Peritremes abbreviated, extending forward only to level of posterior margin of coxae II. Peritremalia extended to encircle coxae IV posteriorly.

Legs. Coxal formula 2.2.2.1, all setae quite unmodified. Dorsal setae on femora and genua I and II only very slightly stronger than other leg setae. Coxae II without strong anterodorsal spine.

Gnathosoma. Tritosternum with simple base, and weakly ciliated laciniae. Deutosternal groove narrow, with about eight tiny groups of two to four denticles. Labial cornicles definite, but small. All four pairs of hypostomal and gnathosomal setae strong, subequal. Gnathobase ventrally with five lines of minute serrations as figured. Tectum weakly convex. Chelicerae with very short shafts, and two well-formed, strongly sclerotized digits. Movable digit edentate but with apex strongly and inwardly curved; fixed digit also with apex strongly curved, and with an accompanying denticle. Pilus dentilis apparently absent. Corona absent. Palpi stout, undistinguished. Claw bifurcate.



Text-fig. 8. *Hattena erosa*, n. g., n. sp. Female. Venter.

Hirstionyssus musculi (Johnston).

Dermanyssus musculi Johnston, 1849, *The acarides of Berwickshire specifically described* in *History of the Berwickshire Naturalists' Club*, Berwick-upon-Tweed, p. 362–373.—*Hirstionyssus musculi*, Bregetova, 1956, [*Gamasid mites*], USSR Academy of Sciences, Moscow and Leningrad, p. 184.

Two final records of this species from Australia would not be out of place—*Mus musculus*. Hobart, Tas., 12.iv.1962, B.C.M.; *M. musculus*, Maria Is., Tas., 22.iv.1962, B.C.M.

Ichoronyssus aristippe Domrow.

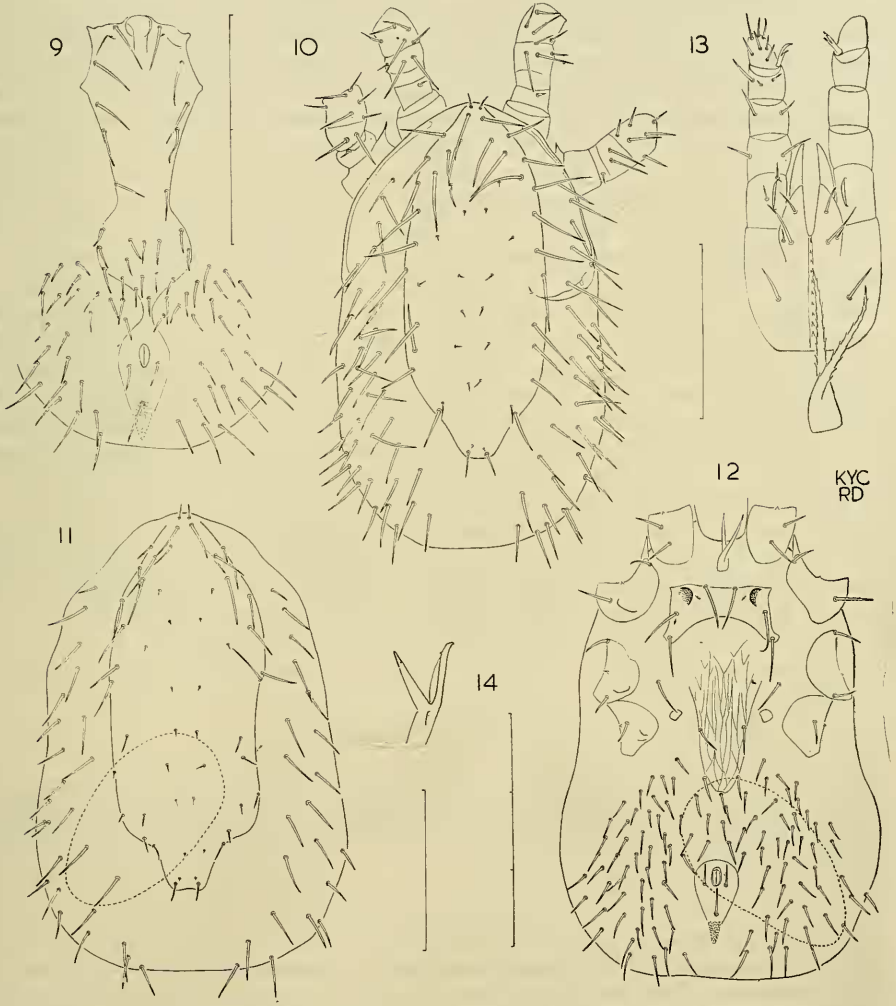
Ichoronyssus aristippe Domrow, 1959, Proc. Linn. Soc. N.S.W., 83: 228.

The following records from *Miniopterus schreibersi* will confirm the original host record—Gatop, Finschhafen Subdistrict, New Guinea, x.1961, B.McM.; Bilak Bokis, Gevak, N.G., 22.i.1962, B. Dew; Wombeyan Caves, N.S.W., 17.v. and 25.viii.1962, B.D.

Ichoronyssus radovskyi, n. sp. (Figs 9–14.)

Diagnosis.—This new species would, in a stricter sense, be held a *Hirstesia*, but I would now confirm my belief (1959) that these two genera are synonyms. Four species of *Hirstesia* have been described, two from Africa and two from Europe (see

Strandtmann and Wharton (1958) for a complete bibliography). The two African species may be separated readily from *I. radovskyi* by their discrete anal shield in the male, while the two European species are distinct in such characters as the shape and setation of the dorsal shield, and the texture of the genital shield and sternal organs in the female. *I. radovskyi* is separated from those typical *Ichoronyssus* species with sternal organs by the presence of usurped ventral setae on the genitoventral shield.



Text-figs 9-14. *Ichoronyssus radovskyi*, n. sp.—9, Venter ♂; 10, Dorsum ♀; 11, Abnormal dorsum ♀; 12, Venter ♀; 13, Gnathosoma ♀; 14, Chelicera ♀.

Type material.—Holotype female, allotype male, seven paratype females and one paratype male from a small brown bat RT8250, bamboo tree, Pahang Road 16 miles N Kuala Lumpur, Selangor, 31.vii.1948, R.T.; also eight paratype females with no data except Pahang Road, 23.iii.1949. Holotype and allotype USNM; paratypes USNM, BMNH, QIMR, R. Traub.

Female.—Idiosoma in unflattened specimens 506–550μ long, but from 616 to 638μ in more compressed material. Dorsal shield rather narrow, tapering and truncate in posterior quarter; with 26 pairs of setae, of which fifteen marginal and anterior pairs are elongate, and one vertical and ten discal pairs minute. One specimen is atypical in

having an extra pair of minute posterodiscals, and many of the other pairs much weaker. Marginal cuticle broadly exposed, the normal specimen illustrated with about 36 pairs of setae similar in strength to those on margin of dorsal shield.

Sternal shield with anterior and lateral margins almost straight; posterior margin evenly concave almost to level of second pair of sternal setae. Shield with usual three pairs of setae and two pairs of pores. Sternal organs semicircular, with inner (rounded) margin well defined, and with punctae heavier near this margin. Metasternal setae present, but metasternal pores apparently absent. Genitoventral shield with usual two genital setae between coxae IV, and with three usurped ventral setae (arranged 2+1) either on or virtually on the shield posteriorly. This is the arrangement in all specimens except two, which bear 2+2 usurped setae. Anal shield elongate pear-shaped, with anus near anterior margin. Adanal setae near posterior of anus, slightly weaker than postanal seta. Cribrum present. Metapodal shields apparently absent. Ventral cuticle with about 52 pairs of setae in specimen figured. Peritremes reaching forward to middle of coxae I in both sexes. Peritremalia extended posteriorly around coxae IV.

Legs. Coxal formula 2.2.2.1, none of these setae being expanded. Coxa II with spinose anterodorsal process. Coxae II–IV with superficial crescentic marking in posterior half. Genua and femora I and II with few slightly stronger setae dorsally.

Gnathosoma. Tritosternum with simple base and two weakly ciliated laciniae. Deutosternum with single file of about ten small denticles. Gnathosomal and hypostomal setae eight in number, the outer posterior hypostomals rather smaller than the remainder. Labial cornicles not reduced, but very weak and hyaline. Chelicerae with slender shafts, and two equal digits. Fixed digit with inner edge hyaline, a minute denticle subapically, and tip recurved. Movable digit edentate, with tip straight, spinose, and rather more heavily sclerotized than remainder of digit. Palpi with five free segments, and a narrow, longitudinal expansion on the trochanter. Claws bifurcate.

Male.—Idiosoma 484μ long in somewhat flattened specimen figured. Dorsal surface essentially as in female. Holoventral shield normal from level of genital setae forwards. Ventral area slightly expanded behind coxae IV, with about fifteen usurped setae. The shield then constricts rapidly to a narrow neck, so that the anal shield is virtually free. Anal area as in female. Ventral cuticle with about 26 pairs of setae.

Gnathosoma not clear, but chelicerae not grossly modified, and of about same size as in female.

Laelaps assimilis Womersley.

Laelaps assimilis Womersley, 1956, *J. Linn. Soc. Lond. (Zool.)*, 42: 557.

This species is common on *Rattus assimilis* in eastern Australia, and on *R. culmorum* in S.E. Queensland. It is also abundant on *R. lutreolus* and *R. l. velutinus* in Tasmania—Maydena, 20.viii.1960, B.C.M.; Kelso, 19.ii.1961, B.C.M.; Green's Beach, 10.v.1961, R.H.G.; St. Valentine's Peak, 13.vii.1962, B.C.M.

Laelaps calabyi Domrow.

Laelaps calabyi Domrow, 1961, Proc. Linn. Soc. N.S.W., 86: 67.

The following material from *Pseudomys higginsi* from Tasmania will confirm the original host record — Mt. Wellington 4000′, n. d.; Arve Valley, xii.1956; St. Valentine's Peak, 13.vii.1962, B.C.M.

Laelaps cybiala, n. sp. (Figs 15–17.)

Diagnosis.—Closely related to *L. calabyi* Domrow, but readily separable on both morphological (female) and ecological data, as follows:

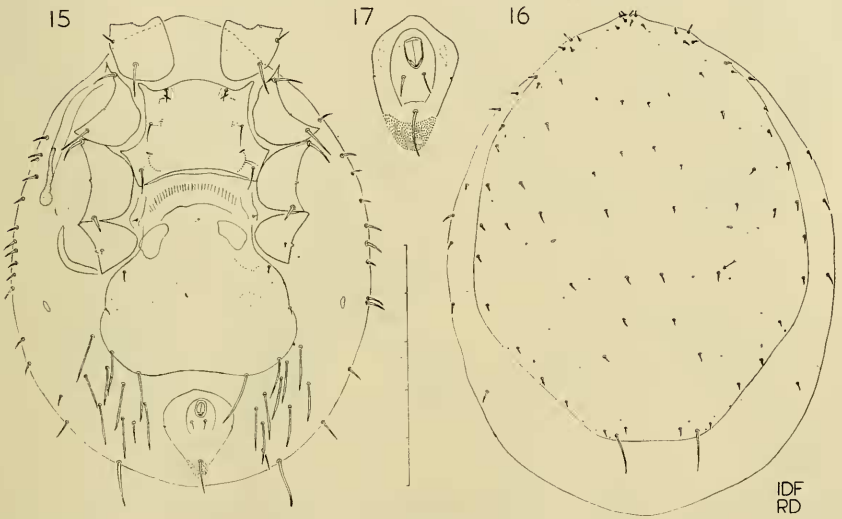
L. calabyi with anal plate as wide as long, with all three anal setae minute and subequal; ventral body cuticle with only two pairs of elongate setae.

L. cybiala with anal plate noticeably longer than wide, with postanal seta very much stronger than minute adanals; ventral body cuticle with seven or eight pairs of elongate setae.

I have several series of both species; all specimens of *L. calabyi* are from *Pseudomys higginsi*, and all of *L. cybiala* from *Mastacomys fuscus*.

Type material.—Holotype female (normal), six paratype females (two normal and four giant), and one paratype male from the broad-toothed rat, *Mastacomys fuscus* Thomas, White's River, Mt. Kosciusko, N.S.W., i-ii.1962, J.H.C. and D. L. McIntosh; allotype male and one paratype female (giant) from *M. fuscus*, Port Davey, Tas., 1951; six paratype females (normal) and one paratype male from *M. fuscus*, White's River, 16.i.1962, J.H.C.; one paratype female (giant), *M. fuscus*, Madden's Hill Road, Aire Valley, Otway Ranges, Vic., 10.viii.1962, R. M. Warneke. Holotype and allotype NIC; paratypes NIC, BMNH, USNM, QIMR.

Female.—A broadly oval species, with idiosomal length 979–1034μ in normal specimens, and 1485–1562μ in giant specimens. Dorsal shield tapering and truncate in posterior half, leaving broad band of marginal cuticle unoccupied posteriorly, except for five to seven pairs of short setae. Thirty-five pairs of setae, all minute except the terminal pair, are present on the shield, together with numerous symmetrically arranged pores. (The pair of setae indicated by an arrow is absent in normal specimens of *L. calabyi*, but present in giant specimens.)



Text-figs 15-17. *Laelaps cybiala*, n. sp. Female.—15, Venter; 16, Dorsum; 17, Anal plate of giant form.

Venter. Sternal shield as in *L. calabyi*, but with setae relatively rather longer. Metasternal setae minute, apparently without attendant spores. Genitoventral shield broadly expanded behind coxae IV, slightly sinuate at level of minute first pair of usurped ventral setae, and slightly concave along posterior margin. Posterior two pairs of usurped ventral setae very elongate compared to minute first and genital pairs. Anal shield longer than wide, with anus set near anterior margin; adanal setae minute, set just behind anus; postanal seta very much stronger. Metapodal shields present, but weakly formed. Ventral cuticle with seven or eight pairs of elongate setae in addition to twelve to eighteen pairs of spinose setae, of which the posterior pair are quite strong. Peritreme entirely situated above coxa III; peritremalia not connected to sclerotized band behind coxa IV.

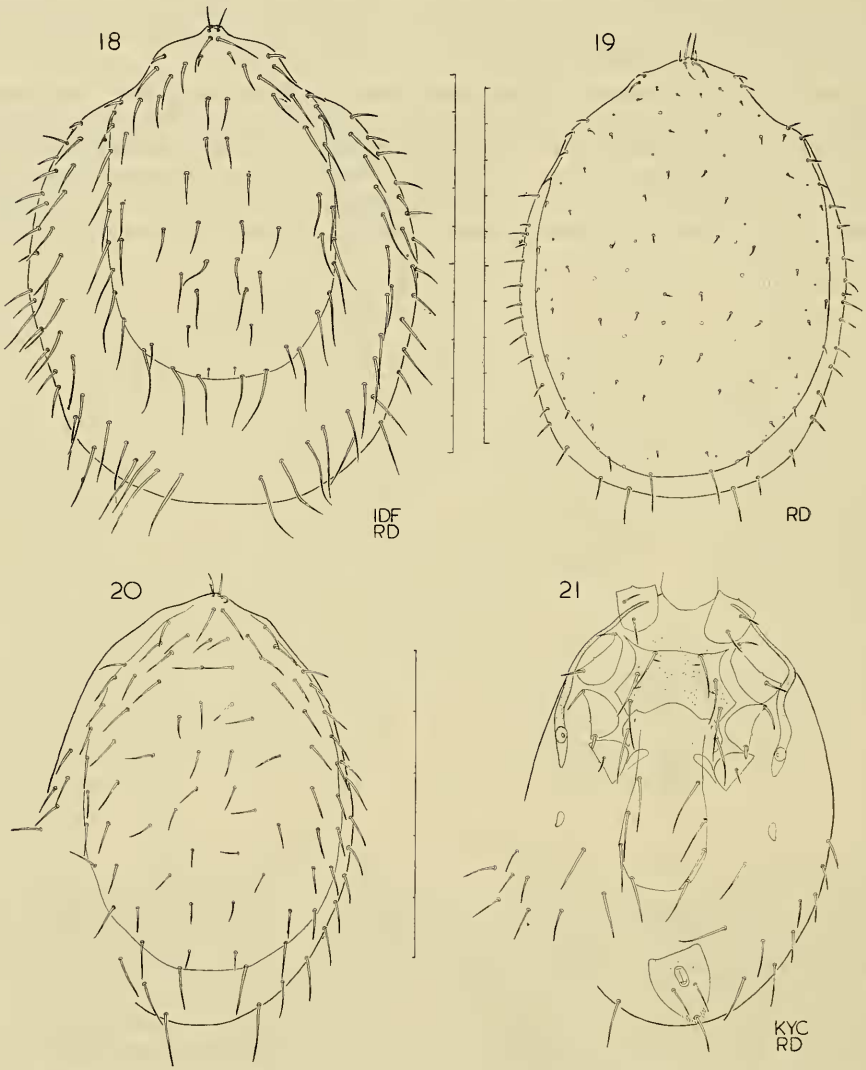
Legs. All coxal setae tapering to a point, but some strongly formed. Seta on coxa IV minute. Femur I with one very long seta, and genu I with one slightly longer seta dorsally.

Gnathosoma as in *L. calabyi*.

Male.—Length of idiosoma 825μ in allotype and 825 and 1243μ in paratypes. As in the female, more hairy than *L. calabyi*. Holoventral shield with six or seven pairs of

usurped ventral setae; postanal seta rather stronger than adanals. Ventral cuticle with about six pairs of rather long setae. Chelicerae as in *L. calabyi*.

Notes.—The specific name *cybiala* is an anagram of *calabyi*, and is to be treated as a noun (nominative singular) in apposition with *Laelaps*.



Text-figs 18-21. *Laelaps* spp. Female.—18, *L. hapaloti* Hirst, dorsum; 19, *L. rothschildi* Hirst, dorsum; 20, *L. mackerrasi* Domrow, dorsum; 21, *L. mackerrasi* Domrow, venter.

LAELAPS FINLAYSONI Womersley.

Laelaps finlaysoni Womersley, 1937, *Parasitology*, 29: 535.

Womersley figures only 28 pairs of setae on the dorsal shield of this species. The correct number is thirty-five. A new host record for this species is three females and three males from *Pseudomys rawlinnae*, Ooldea, S.A., n. d.

LAELAPS HAPALOTI Hirst. (Fig. 18.)

Laelaps hapoloti Hirst, 1931, *Proc. zool. Soc. Lond.*, p. 563.—*L. hapaloti*, Womersley, 1937, *Parasitology*, 29: 532.

Womersley figures only 29 pairs of setae on the dorsal shield of this species. The correct number is thirty-seven.

LAELAPS MACKERRASI Domrow. (Figs 20–21.)

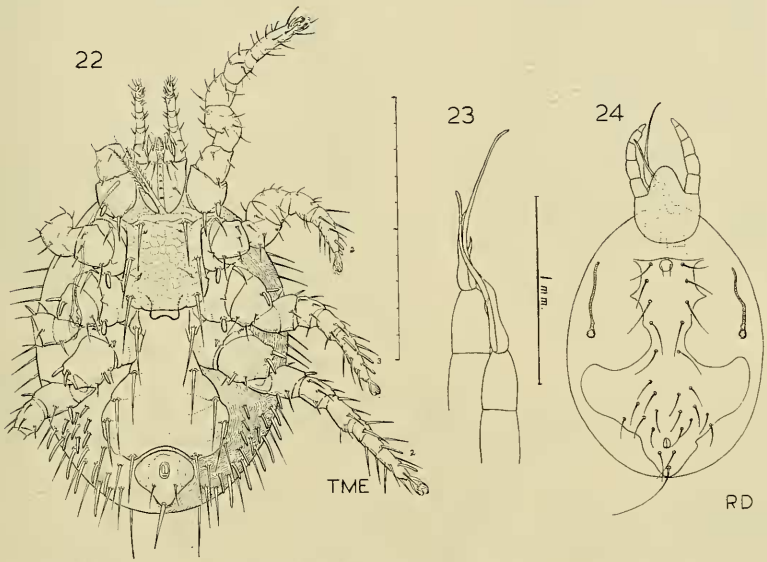
Laelaps mackerrasi Domrow, 1961, PROC. LINN. SOC. N.S.W., 86: 70.

Only the coxal setation and portion of the dorsal shield were figured in the original description. Figures of the full dorsal and ventral surfaces are now given.

LAELAPS ROTHSCHILDI Hirst. (Fig. 19.)

Laelaps rothschildi Hirst, 1914, *Trans. zool. Soc. Lond.*, 20: 325.—*Laelaps melomys* Womersley, 1937, *Parasitology*, 29: 534.

Womersley figures about 37 pairs of "setae" on the dorsal shield of this species, but this pattern is incorrect, because he has missed some setae, and mistaken pores for others. The correct number of setae is 39 pairs.



Text-fig. 22. *Laelaps sculpturata* Vitzthum. Female. Venter.

Text-figs 23-24. *Tricholaelaps vitzthumi* Domrow. Male.—23, Chelicerae (at twice indicated scale); 24, Venter.

LAELAPS SCULPTURATA Vitzthum. (Fig. 22.)

Laelaps (*Laelaps*) *sculpturatus* Vitzthum, 1926, *Treubia*, 8: 64.

Vitzthum has already given a good illustration of the dorsal shield of this species, showing the characteristic darkening of the humeral margins and vertex. Actually there are 39 pairs of setae on the shield. Vitzthum omits one pair near the middle of the more heavily stippled humeral margin, while the most anterior pair of the marginal cuticular setae should be shown on the shield proper. All the remainder are in their correct positions. A figure of the ventral surface of the species, received from the same source as those of *Tricholaelaps vitzthumi*, *v. infra*, is given to supplement the original.

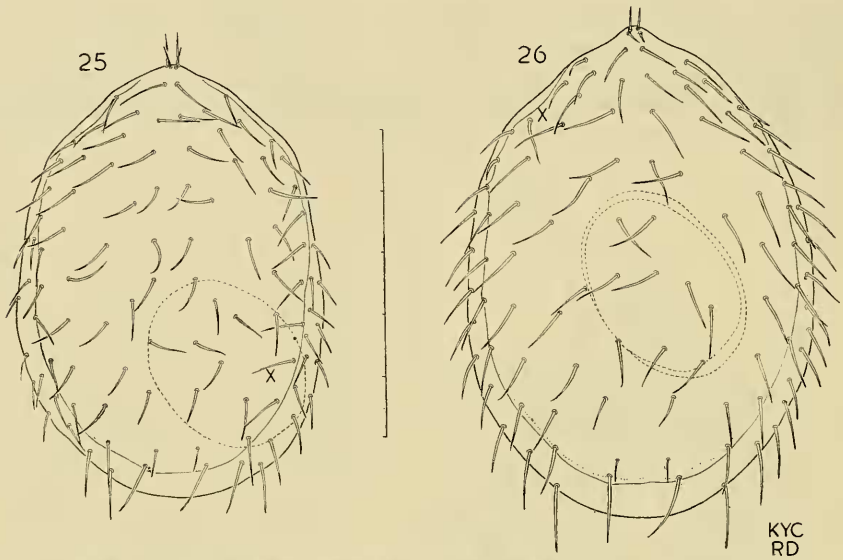
This species was described from *Rattus whiteheadi* in Sumatra, and the following records, all from the type host, are the first since then—two females, Subang, Selangor, 19.iii.1948, R.T.; seventeen females, Subang, 25.iii.1948, R.T. and C. B. Philip; ten females, Subang, 1.iv.1948, R.T.; six females, Subang, 1.v.1948, R.T. and C.B.P.; 28 females, Pahang Road 16 miles N Kuala Lumpur, Selangor, 27.vii.1948, R.T. Also one female, *R. alticola*, Gunong Brinchang 4500′, Cameron Highlands, Malaya, 19.vii.1948, R.T.; 23 females, *R. alticola*, G. Brinchang 5500′, 20.vii.1948, R.T.; 22 females, *R. fulvescens* (2 rats), 18.vii.1948, R.T.; two females, *R. alticola* or *R. fulvescens*, G. Brinchang 5500′, 20.vii.1948, R.T.; one female, *Rattus* sp., G. Brinchang 5500′, 20.vii.1948.

R.T.; four females, *Mus* sp., Pahang Road *etc.*, 20.viii.1948, R.T. and B.E.; 53 females, *Callosciurus notatus*, Pahang Road *etc.*, 25.vii.1948 (some labelled 25.vi.1948), R.T. and B.E.; 23 females, civet cat, Kuala Lumpur, 15.v.1948, R.T. and B.E.

Laelaps southcotti Domrow. (Fig. 25.)

Laelaps southcotti Domrow, 1958, Proc. Linn. Soc. N.S.W., 82: 364.

Only the venter of this species was originally figured. A figure of the dorsum is now given.



Text-figs 25-26. *Laelaps* spp. Female. Dorsum.—25, *L. southcotti* Domrow; 26, *L. wasselli* Domrow. (In each specimen illustrated a seta is lacking at the spot marked X.)

Laelaps wasselli Domrow. (Fig. 26.)

Laelaps wasselli Domrow, 1958, Proc. Linn. Soc. N.S.W., 82: 363.

Only the venter of this species was originally figured. A figure of the dorsum is now given.

Laelapsella humi Womersley.

Laelapsella humi Womersley, 1955, *Aust. J. Zool.*, 3: 417.

This species was originally recorded from the burrows of the mutton bird, *Puffinus tenuirostris*, and I have since seen the following material—one female from *Rattus lutreolus velutinus* (Thomas), Green's Beach, Tas., 10.v.1961, R.H.G.; four females from *R. l. velutinus*, Tonganah, Tas., 20.v.1961, R.H.G.; one female from *R. lutreolus*, Maria Is., Tas., 21.iv.1962, B.C.M.; one female from a marsupial mouse, *Antechinus swainsoni*, Cumberland Picnic Ground, about 12 miles E Marysville, Vic., 11–12.viii.1962, R.M.W. Most specimens show ten to fourteen usurped ventral setae on the genitoventral shield, and a further two or three are normally situated very near to the margin of the shield, but not actually on it. One specimen shows only four usurped setae actually on the shield, and six close by.

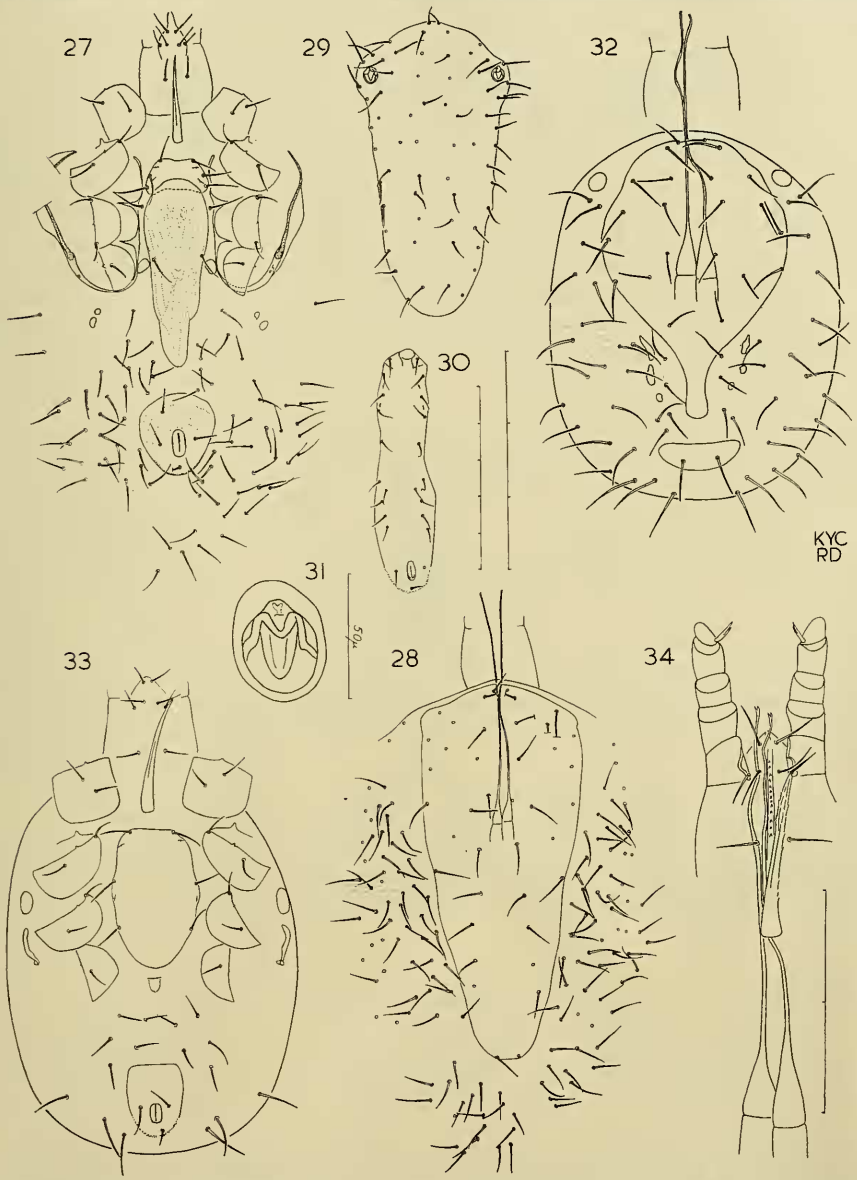
Liponyssoides muris Hirst. (Figs 27–34.)

Dermanyssus (*Liponyssoides*) *muris* Hirst, 1913, *Bull. ent. Res.*, 4: 120.—*Dermanyssus muris*, Hirst, 1914, *Bull. ent. Res.*, 5: 216.

This species has been recorded from several countries in Africa and Asia, but not Thailand. I have recently seen specimens of all stages from rodents 22, 28 and 30, Ban Den, a village contiguous with the city of Chiang Mai, Chiang Mai Province, Thailand, 6.ii.1952, D.C. and E. B. Thurman.

LIPONYSSOIDES WARNEKEI, n. sp. (Figs 35–44.)

Diagnosis.—Strandtmann and Wharton (1958) place two species in this genus, *muris* Hirst and *brasiliensis* (da Fonseca), which from a comparison of published data appear extremely similar indeed. *L. warnekei* is separable in the female by its peculiar



Text-figs 27-34. *Liponyssoides muris* Hirst.—27, Venter ♀; 28, Dorsum ♀; 29, Dorsal shield ♂; 30, Holoventral shield ♂; 31, Pore on dorsal shield ♂; 32, Dorsum, protonymph; 33, Venter, protonymph; 34, Gnathosoma, protonymph.

sternal-metasternal complex, and in the male by the absence of immense humeral pores on the dorsal shield. The three genera included in the Dermanyssinae by these authors appear in need of revision.

Type material.—Holotype female, two paratype females, allotype male, one paratype male, and two morphotype deutonymphs from a swiftlet, *Collocalia banicorensis*

(Apodidae), in a cave at Gatop (147° 15′ E, 6° 03′ S), Finschhafen Subdistrict, N.G., x.1960, B.McM.; one paratype male from a bent-winged bat, *Miniopterus schreibersi* (Kuhl) (Vespertilionidae), same locality and collector, but x.1961. Holotype and allotype SPHTM; paratypes and morphotypes BMNH, QIMR.

Text-figs 35-43. *Liponyssoides warnekei*, n. sp.—35, Dorsum ♀; 36, Venter ♀; 37, Gnathosoma ♀; 38, Coxa I; 39, Tarsus IV ♂; 40, Basally expanded seta on tarsus IV ♂; 41, Chelicera ♂; 42, Dorsum ♂; 43, Venter ♂.

Female.—An elongate oval species 1067μ long in relatively unfed specimens, but up to 1760μ in specimens replete with blood. Dorsal shield broad anteriorly, but tapering and rather narrower towards the rear; probably usually with seventeen pairs of setae, but frequently with a seta or two lacking anteriorly, posteriorly, or on the shoulders. Dorsal body cuticle broadly exposed, with several weakly marked pores, and one very strong one; with about 36–40 pairs of setae similar to those on dorsal shield.

Venter. Sternal shield fragmented, the main subquadrate anterior portion bearing three pairs of setae and one pair of pores. Second pair of sternal pores borne on isolated sternal shieldlets. Metasternal setae and pores free in cuticle. Genital shield acutely tapered posteriorly, with two genital setae; flanked posterolaterally by three pairs of minute platelets. Anal shield broadly rounded anteriorly, with anus centrally placed. Adanal setae near posterior of anus, subequal to postanal seta. Ventral cuticle with about 33 pairs of setae, which are longer posteriorly. Metapodal shields double, the posterior pair much the stronger. Peritremes reaching forward to level of coxae II; peritremalia fused to sclerotized band behind coxae IV.

Legs. Coxal formula 2.2.2.1, all setae being unmodified. Coxa II without process anterodorsally.

Gnathosoma. Tritosternal base unarmed; laciniae apparently fused. Deutosternum with about ten denticles in single file. All four pairs of setae on gnathobase subequal. Rostral structures modified into cone-like tube, through which pass the chelicerae. Chelicerae housed in transversely striate cylinders which extend into rostral cone; basal segment fairly stout, but distal segment extremely attenuate, and slightly serrate distally. Palpal armature undistinguished except for one very slender seta on trochanter, and one broadly clavate seta on genu.

Male.—Length of idiosoma in all specimens (slightly fed) 880–913μ. Dorsal shield much more extensive than in female, taking in some fourteen pairs of setae and the large pores found on the cuticle in that sex. The pattern of setae anteriorly and medially, however, resembles that in the female, *see* dotted line. Dorsal marginal cuticle very narrow, with nine to twelve setae on each side.

Venter. Holoventral shield entire, unexpanded behind coxae IV, and with three pairs of usurped ventral setae. The endopodal shields are discrete. Ventral cuticle with 20–22 pairs of setae. Peritremes and metapodal shields as in female.

Legs as in female, except for basally expanded seta on inner face of tarsi III and IV.

Chelicerae in sheath as in ♀; fixed digit obsolescent; spermatophore carrier as long as central segment, apparently tubular. In dorsal view, the chelicerae appear somewhat more slender than in the lateral view illustrated, but the attenuation does not approach that found in the female.

Deutonymph.—Idiosoma 1100μ long in replete specimen. Dorsal shield as in female, except that only three pairs of humeral setae are present rather than four or five. Sternal shield occupying space between coxae II–IV, extremely weakly formed posteriorly. All three pairs of sternal setae and pores are present on the shield, while the metasternal setae are off the shield, and the future genital pair variable. Ventral cuticle with about 25–30 pairs of setae.

Mesolaelaps antipodiana (Hirst).

Laelaps (*Heterolaelaps*) *antipodiana* Hirst, 1926, *Proc. zool. Soc. Lond.*, p. 838.

The following are some further records from Tasmania—*Perameles gunnii*, Maydena, 29.xi.1960, B.C.M.; *Isoodon obesulus*, Perth, 8.viii.1961, R.H.G.; Eaglehawk Neck, 9.ix.1961, T.A.; Cascades, Hobart, 5.vii.1962, B.C.M. and T.A.; St. Valentine's Peak, 13.vii.1962, B.C.M.; St. Valentine's Peak, 2.ix.1962, T.A.; Rokeby, 19.ix.1962, T.A. I also have one specimen from *Petaurus breviceps*, Vermont, near Melbourne, Vic., 31.v.1962, R.M.W. Mr. Warneke tells me this glider was captured by a cat in an area where bandicoots occur, but that he had had no bandicoots through his hands at the time the glider was caught. Perhaps the cat had also caught a bandicoot lately.

Mesolaelaps australiensis Hirst.

Laelaps (*Mesolaelaps*) *australiensis* Hirst, 1926, *Proc. zool. Soc. Lond.*, p. 840.

The following are three interesting records of this species—nests of fairy penguins, Bowen Is., N.S.W., i.1962, B.McM.; *Tachyglossus aculeatus*, Forest Beach, 12 miles from Ingham, Qld., 8.i.1962, K. Harley; *Mus musculus*, Toowoomba, Qld., iv.1960, E. H. Derrick.

Mesolaelaps bandicoota (Womersley).

Hypoaspis bandicoota Womersley, 1956, *J. Linn. Soc. Lond. (Zool.)*, 42: 573.

The following are additional records for this species, extending considerably its geographical and host ranges—*Rattus lutreolus velutinus*, Kelso, Tas., 19.ii.1961, B.C.M.; *R. l. velutinus*, Green's Beach, Tas., 10.v.1961, R.H.G.; *R. assimilis*, Tooloom, N.S.W., 15.xi.1961, J.H.C.; *Perameles nasuta*, Mt. Lindesay, N.S.W., 6.xi.1961, J.H.C.

Mesolaelaps sminthopsis (Womersley). (Fig. 54.)

Laelaps (*Laelaps*) *sminthopsis* Womersley, 1954, *Rec. S. Aust. Mus.*, 11: 117.

The following material has recently been examined, all from marsupial mice (Dasyuridae)—one female and one nymph, *Sminthopsis crassicaudata*, laboratory colony, Dept. Fisheries and Wildlife, Melbourne, Vic., 20.v.1962, R.M.W.; eleven females, *A. f. flavipes*. Pearl Beach, 30 miles NE Sydney, N.S.W., various days, viii.1955, B. E. Horner and M. J. Taylor; numerous specimens, mostly females, from *A. flavipes* as follows—Nambour, Qld., 6.viii.1962, D. W. Agnew; Mt. Glorious, Qld., 24.x.1962, R.D.; Tuggolo State Forest, N.S.W., 21.iii.1960, J. Bromell; Picton, N.S.W., 27.vi.1961, B.McM.; Gelantipy, Vic., 31.viii.1961, A. Hodge; Mt. Clay, Heathmere, Vic., 10.i.1962, R.M.W.; Ben Nevis, Vic., 20.iii.1962, A. L. Streefkeck; 8 miles from Buchan on Buchan-Bruthen Road, Vic., 9, 10 and 11.iv.1962, R.M.W.; Cathedral Range, Vic., 17.vi.1962, R.M.W.; laboratory colony, Dept. Fisheries and Wildlife, Melbourne, Vic., 10.vii.1962, R.M.W.; Glenlofty, Vic., 15.vii.1962, R.M.W.; Pannican Creek, Nelson Road, Portland, Vic., 17.vii.1962, R.M.W.; Landsborough, Vic., 17.vii.1962, R.M.W.

Notes.—In the female of this species, there is considerable variation in the armature of the coxae. Occasional specimens have all setae unexpanded, but expansion involving progressively the posterior seta on coxa I and the anterior seta on coxae II and III is more typical.

The male of *M. sminthopsis* may be distinguished by the following combination of characters—anal shield discrete, separated from remainder of holoventral shield by band of striate cuticle; ventral area of holoventral shield only slightly wider than sternal area, with about seven or eight pairs of usurped setae; dorsal shield with two outstanding discal setae posterolaterally.

Myonyssus decumani Tiraboschi.

Myonyssus decumani Tiraboschi, 1904, *Archiv. Parasitol.*, 8: 337.—*M. decumani*. Hirst, 1916, *J. zool. Res.*, 1: 64.

Three females from the short-nosed bandicoot, *Isoodon obesulus* (Shaw), Rokeby, Tas., 19.ix.1962, T.A. This is the first record of this subfamily from the Southern Hemisphere, *M. decumani* being a common parasite of small rodents in Europe, including the cosmopolitan *Mus musculus* and *Rattus norvegicus*. The present specimens agree perfectly with Hirst's detailed figure, even to the single asymmetrical usurped ventral seta on the ventroanal shield. Hirst figures 4 + 4 usurped ventral setae on the genito-ventral shield; in my specimens these setae are arranged 2 + 2, 2 + 3 and 3 + 4.

Neolaelaps spinosa (Berlese).

Leiognathus spinosus Berlese, 1910, *Redia*, 6: 261.—*Liponyssus magnistigmatus*. Vitzthum, 1926, *Treubia*, 8: 93.—*Neolaelaps spinosus*, Domrow, 1961, Proc. Linn. Soc. N.S.W., 86: 71.

The following record will support my earlier reports of this species being associated with flies parasitizing fruit bats—thirteen females and four males, on nycteribiids on *Pteropus gouldi*, junction of Liverpool and Tomlinson Rivers, Northern Territory, 23.viii.1962, J.H.C. Also two females from *P. scapulatus*, Tooloom, N.S.W., 1.xii.1961, J.H.C.

Ophionyssus natricis (Gervais).

Dermanyssus natricis Gervais, 1844, *Hist. nat. Insect. apt.*, 3: 223.—*Ophionyssus natricis*, Camin, 1949, *J. Parasitol.*, 35: 583.

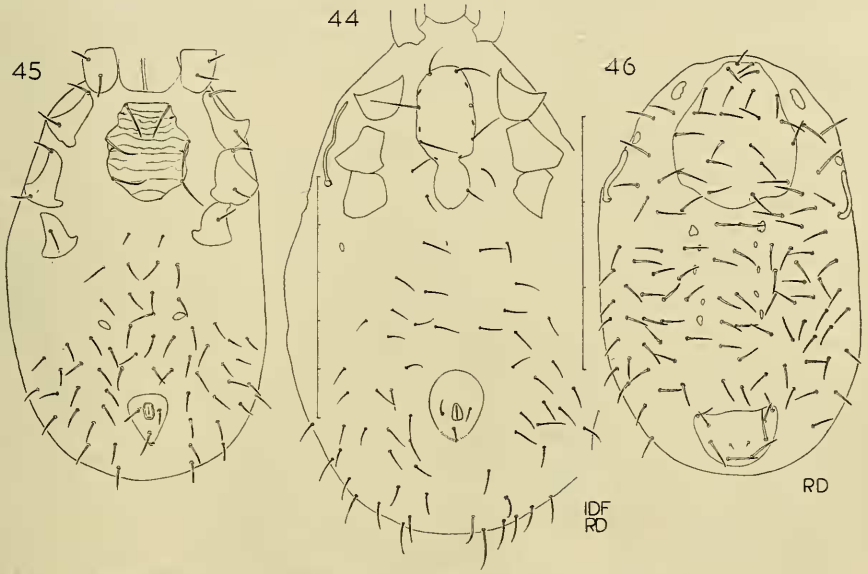
Nine females from *Tropidechis carinatus*, north coast of N.S.W., 1955. B.E.H. and M.J.T.

ORNITHONYSSUS BACOTI (Hirst).

Leiognathus bacoti Hirst, 1913, *Bull. ent. Res.*, 4: 122.—*L. bacoti*, Hirst, 1914, *Bull. ent. Res.*, 5: 225.

Numerous specimens from *Mus musculus*, laboratory colony, Brisbane, Qld., iv.1953, E.H.D.; ii.1963, J. G. Carley and I. Cook; wild caught, Brisbane, 2.vi.1959, R.D.; Mt. Tyson, Qld., 30.vii.1959, E.H.D.; *Rattus rattus*, Toowoomba, Qld., iii.1960, E.H.D.; Tooloom, N.S.W., 14.xi.1961, J.H.C.; *R. norvegicus*, Brisbane, 10.viii.1951, E.H.D.; *Sminthopsis crassicaudata*, laboratory colony, Melbourne, Vic., 20.v.1962, R.M.W.; irritating man in laboratory, Brisbane, 21.xi.1960, G. M. J. Rodda; in factory, Brisbane, xi.1960.

This species does not seem so distinctly seasonal as *O. bursa*, the other common species in Brisbane.



Text-fig. 44. *Liponyssoides warnekei*, n. sp. Deutonymph. Venter.
Text-figs 45-46. *Ornithonyssus latro*, n. sp. Protonymph.—45, Venter; 46, Dorsum.

ORNITHONYSSUS BURSA (Berlese).

Leiognathus bursa Berlese, 1888, *Acar. myriap. scorp. Ital. repert.* (*Mesostigmata*), Padua, p. 208.—*Liponyssus bursa*, Hirst, 1922, *Mites injurious to domestic animals*, B.M. (N.H.), p. 89.

Numerous specimens from birds and birds' nests in Brisbane (Qld.) suburbs—sparrows, Herston, xi.1949, J. H. Pope and R.D.; Herston, 18.x.1955, R.D.; starlings, Taringa, 1.xi.1950, E.H.D.; pigeons, Kangaroo Point, 15.x.1954; Yeerongpilly, n. d. Also four females and two nymphs, nest of *Hylochelidon ariel*, Marrar, N.S.W., 23.xii.1959, A. L. Dyce; twelve females from *Isoodon macrourus*, 7.x.1950, Taringa, E.H.D. Also irritating man in Brisbane, xii.1948, I.C.; 5.xii.1949, E.H.D.; 28.xi.1952, C. J. Ross; iv.1957, C. J. Tuckfield; 22.xi.1960, M. J. Mackerras; 21.xi.1962, A. R. Brimblecombe; iii.1963, A. Van Kammen; iii.1963, J. Welch; vi.1958; x.1958; 3.xii.1960; and Esk, Qld., ii.1948, Dr. Whyte. With two exceptions, these Australian records are all from the summer months. Also the following material from S.E. Asia—three females, squirrel's nest, Gunong Brinchang, Cameron Highlands, Malaya, 18.vii.1948, R.T. and B.E.; three females and two protonymphs, *Lariscus insignis*, Pahang Road 16 miles N Kuala Lumpur, 27.vii.1948, R.T.; three females, Kebun Bunga (*i.e.* Lake Gardens), Kuala Lumpur, 10.iv.1949; nine females, two males and thirteen protonymphs, nest of unidentified bird RTB9099 and unidentified birds RTB9100, Tenompak, Mt. Kinabalu, B.N.B., 26.vii.1951, C. Wharton and R.T.

Ornithonyssus latro, n. sp. (Figs 45–53.)

Diagnosis.—*O. latro* is closely related to an African parasite of bats, *O. aethiopicus* (Hirst) (= *O. forsythi* (Zumpt)), a synonymy suggested by Keegan (1956). Dr. Zumpt has kindly forwarded me a paratype female and protonymph of *forsythi*, and two females of *aethiopicus* (*Scoteinus schlieffeni*, Mambone, Mozambique). These are all clearly conspecific, the former material having been excessively cleared. In the posterior half of the dorsal shield, *O. latro* has 40 pairs of setae compared with the 24–27 pairs in *O. aethiopicus*. However, both species have 16 pairs in the anterior half, and are also otherwise very alike, and may eventually prove but variants of one species.

Text-figs 47-53. *Ornithonyssus latro*, n. sp. Female.—47, Fragment of ventral cuticle; 48, Coxae I-IV (from right to left); 49, Sternal area; 50, Gnathosoma; 51, Dorsum; 52, Genital area; 53, Anal area.

A similar situation exists in the genus *Bewsiella* Domrow. Two species are known from bats (*B. fledermaus* Domrow from Australia and *B. aelleni* (Till) from Africa), and are identical except for the greater hairiness of the postdorsal shield in the Australian species. Further, specimens of *Spinolaelaps miniopteri* (Zumpt and Patterson) from African and Australian bats are indistinguishable.

Type material.—Holotype female and eight morphotype protonymphs from a bat, *Eptesicus pumilus* (Gray) (Vespertilionidae), Gorge Creek, Bonalbo, N.S.W., 17.iii.1961, J.H.C. Holotype NIC; morphotypes NIC and QIMR.

Female.—Size of engorged specimen unavailable because of fracture during mounting procedure. Dorsal shield small, leaving broad band of cuticle exposed laterally and posteriorly. Shield broadest in anterior third, but tapering twice towards the posterior, the sides of these two sections being parallel. Extreme posterior margin evenly

rounded. Anterior half of shield with sixteen pairs of evenly arranged setae. Posterior half with 40 pairs of setae, which are irregular except posteriorly, and of which one subterminal pair is very much weaker than the remainder. Marginal cuticle very hairy, with about 140 pairs of setae.

Venter. Sternal shield weakly defined, with posterior half a little denser, and weakly demarcated from the anterior half. Two pairs of setae and pores are borne on the shield. Third sternal and metasternal setae set free in cuticle. Metasternal pores apparently absent. Genital shield tapering, with usual two genital setae; marked by two forwardly converging striae. Anal shield rounded anteriorly, and pointed posteriorly. Anus set well forward, with adanal setae set just behind its centre. Postanal seta subequal to adanals. Metapodal shields very weakly defined. Ventral cuticle with about 60 pairs of setae. Peritreme abbreviated, reaching forward only to posterior half of coxa II, although the peritremal plate reaches forward to the anterior margin of coxa II. Peritremalia extended around coxa IV posteriorly.

Legs. Coxal formula 2.2.2.1, none of the setae modified. Anterodorsal margin of coxa II with stout spine. Dorsal setae on genu and femur not stronger on leg I, but slightly so on leg II.

Gnathosoma. Tritosternal base slender, unarmed; laciniae slender, weakly barbed. Deutosternum with about six denticles in single file. Gnathosomal and hypostomal setae eight in number, the inner posterior hypostomals the longest. Labial cornicles weak. Palpi with five free segments, the trochanter with a distinct salient process ventrointernally. Two or three setae on genu and femur stronger than remainder. Claw bifurcate. Chelicerae with slender shafts, the basal segment very short. Digits equal in length, and very weakly sclerotized. Fixed digit irregular in outline; movable digit with hyaline margins, and sometimes apparently short due to foreshortening. Digits preceded by stout, but weakly sclerotized spine near end of shaft.

Protonymph.—Idiosoma 495μ long in unengorged specimen figured, but considerably larger in engorged mounted specimens. Anterodorsal shield with eleven pairs of setae. Postdorsal shield with anterior margin sinuous, and posterior margin strongly convex; with four pairs of large setae laterally and one minute pair discally. Dorsal cuticle with five pairs of shieldlets centrally, of which the first two pairs are on the surface, and the posterior three pairs subdermal. With about 42 pairs of dorsal setae. Peritremes above coxae III and each preceded by two shieldlets.

Venter. Intercoxal shield irregular in outline, with transverse striae, three pairs of setae and two pairs of pores. Anal shield triangular, with anus and setation as figured. Ventral cuticle with two shieldlets and about 28 pairs of setae.

Chelicerae as in female.

Ornithonyssus sylviarum (Canestrini and Fanzago).

Dermanyssus sylviarum Canestrini and Fanzago, 1877, *Atti Ist. Veneto*, 4: 124.—*Ornithonyssus sylviarum*, Strandtmann and Wharton, 1958, *A manual of mesostigmatid mites parasitic on vertebrates*, Institute of Acarology, College Park, p. 81.

Three females from *Passer domesticus*, Antill Ponds, Tas., 7.ii.1959, R.H.G.; four females from nest of noisy miner (*Myzantha melanocephala*), Lake George, N.S.W., 20.x.1960, I. Rowley.

Orthohalarachne attenuata (Banks). (Figs 55–58.)

Halarachne attenuata Banks, 1910, *Proc. ent. Soc. Wash.*, 12: 3.—*Orthohalarachne attenuata*, Newell, 1947, *Bull. Bingham Oceanogr. Coll.*, 10: 250.—*Halarachne reflexa* Tubb, 1937, *Proc. Roy. Soc. Vic.*, 49: 417. *New synonymy.*

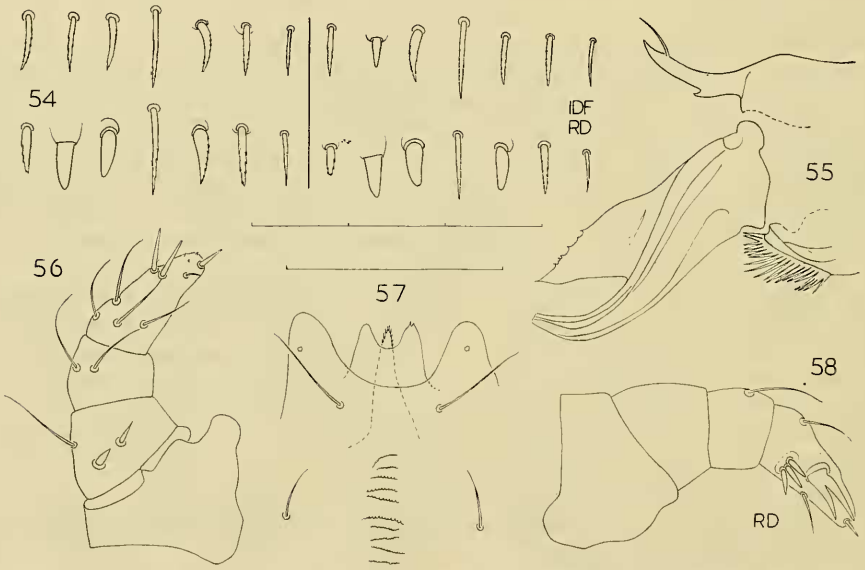
Notes.—The above synonymy, suggested by Newell, may now be confirmed, after an examination of a male and three females, in good condition, from Tubb's material. kindly donated by the late Mr. H. Womersley. Detailed drawings of certain male structures are given to support this conclusion. Particularly to be noted are the structure of the chelicerae, and the comb of three closely set setae on the inner face

of the palpal tibiotarsus. In Newell's material, one male had five setae on one palpal genu, four being the usual number. The specimen I examined also shows variation, the palpal genu and femur each showing four setae on one side, and three on the other. One palp is, however, now lost. In all other characters of both sexes, my material is identical with Newell's extremely detailed figures.

I have also been able to examine four females from the trachea of the earless Australian fur seal, *Arctocephalus doriferus* Wood Jones (= *A. tasmanicus* Scott and Lord) (Otariidae), Port Arlington, Vic., 17.iv.1962, R.M.W.

Newell recorded *O. attenuata* from *Callorhinus ursinus* (Linnaeus) and *Eumetopias jubata* (Schreber) (Otariidae), and I am grateful to Mr. J. H. Calaby, Division of Wildlife Research, CSIRO, Canberra, for the following information on seals (see Scheffer, 1958).

"The combined range of the two [Australian] 'species' [of *Arctocephalus*] is from south-western Australia around the southern coast and coastal islands, including Tasmania, and for some distance up the New South Wales coast. However, there is no



Text-fig. 54. *Mesolaelaps sminthopsis* (Womersley). Female. Four variations in armature of coxae I-IV (from left to right).

Text-figs 55-58. *Orthohalarachne attenuata* (Banks). Male.—55, Chelicera; 56, Palpal exterior; 57, Gnathobase; 58, Palpal interior.

objective evidence that two species are involved and all of them should be called *doriferus*. Some minor cranial and other differences have been pointed out but samples examined have been very small, skulls change very much with age and seal skulls are notoriously variable anyway.

"*Callorhinus* is a monotypic genus with few breeding stations all in the north Pacific. (It is the well-known fur seal of the Pribilof Islands.) In the non-breeding season it ranges from about 30° N latitude [north Baja California] to the edge of the Arctic ice. It is closely related to the genus *Arctocephalus* which is entirely southern except for one species which ranges sporadically up the American west coast to Baja California.

"*Eumetopias* is also monotypic. It is commonly called the Steller sea lion. It is exclusively north Pacific in distribution ranging from Japan around the north Pacific to California. In the Pribilof Island it breeds side by side with *Callorhinus*. . . . However [systematically], none of the sea lions [Otariidae] are very far apart really."

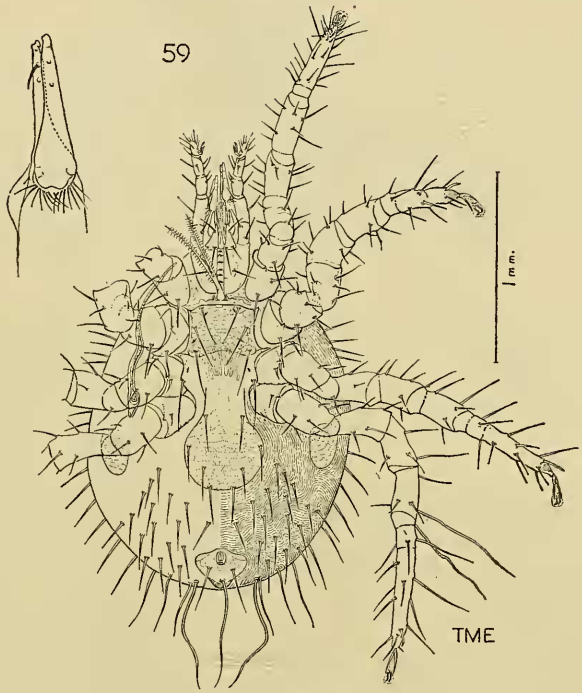
RAILLIETIA AURIS (Leidy).

Gamasus auris Leidy, 1872, *Proc. Philadelphia Acad. nat. Sci.*, 24: 138.—*Raillietia auris*, Olsen and Bracken, 1950, *Vet. Med.*, 45: 320.

There is a single female of this economically important species in the South Australian Museum, Adelaide, from the auditory meatus of a cow, Yannathon, Victoria. I know of no other Australian record.

SPINOLAELAPS MINIOPTERI (Zumpt and Patterson).

Neospinolaelaps miniopteri Zumpt and Patterson, 1952, *J. ent. Soc. S. Afr.*, 15: 159.—*Plesiolaelaps miniopterus* Womersley, 1957, *Trans. Roy. Soc. S. Aust.*, 80: 68. Female only.



Text-fig. 59. *Tricholaelaps vitzthumi* Domrow. Female. Venter (with inset showing chelicera).

I have recently been able to examine all stages of this species as follows, from the bent-winged bat, *Miniopterus schreibersi*, Bilak Bokis, Gevak, N.G., 22.i.1962, B.D.; Ingham, Queensland, ix.1961, K.H.; Wombeyan Caves, N.S.W., 17.v.1962, B.D.; Sydney Railway Tunnel, N.S.W., 21.vii.1962, B.D.

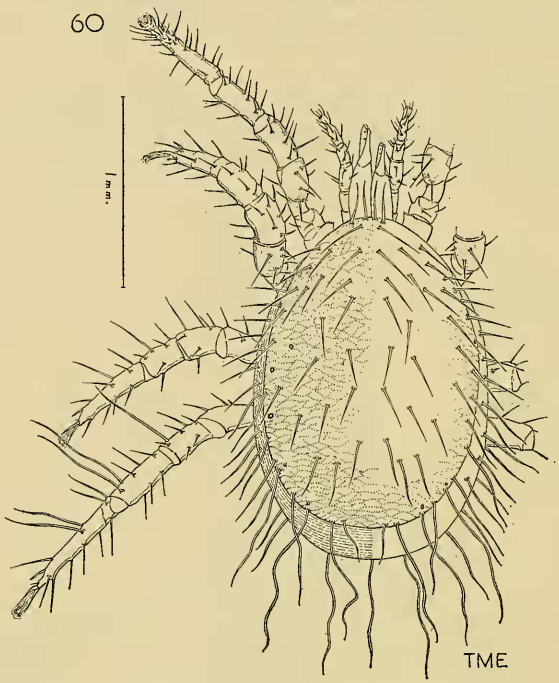
TRICHOLAELAPS VITZTHUMI, n. nom. (Figs 23–24, 59–60.)

Laelaps (*Tricholaelaps*) *comatus* Vitzthum, 1926, *Treubia*, 8: 69, *nec Laelaps* (*Laelaps*) *comatus* Berlese, 1910, *Redia*, 6: 371.

Tipton (1960) has already indicated some of the deficiencies in the original description of this monotypic genus, and the present illustrations by Mr. Thomas M. Evans (given to me by Dr. E. W. Baker through the courtesy of Lt.-Col. Robert Traub and the Smithsonian Institution) should better allow its recognition.

T. vitzthumi was described from *Rattus whiteheadi* in Sumatra, and the following records from the type host are the first since then—two females, Subang, Selangor, 19.iii.1948, R.T.; eight females, Subang, 25.iii.1948, R.T. and C.B.P.; one female, Pahang Road 16 miles N Kuala Lumpur, Selangor, 27.vii.1948, R.T.; two females (two rats),

Pahang Road *etc.*, 18.xi.1948, R.T. and B.E.; two females, Pahang Road *etc.*, 27.i.1949, B.E. and L. Frick. Also nine females and one male, *Callosciurus notatus*, Pahang Road *etc.*, 25.vi.1948, R.T.



Text-fig. 60. *Tricholaelaps vitzthumi* Domrow. Female. Dorsum. (Three lateral setae on the left of the dorsal shield are indicated only by their bases.)

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